

Checklist for Sustainable Design

Sustainable design is the idea of creating buildings and landscapes that join the highest positive regard for our quality of life with the least ecological consequences to our environment. Sustainable design attempts to balance economic, social, and environmental factors. For best results, sustainability should be clearly articulated as a guiding principle for project development, and incorporated into the project from the earliest stages. Sustainable design principles affect all phases of project development, from design, construction, operations and maintenance, and demolition and disposal.

Benefits of sustainable design include more healthy indoor environments, dollar savings over time, and maximization of resource conservation. Sustainability should be celebrated as a core value to the community, as it represents a unique opportunity to clarify our shared values and transmit these to future generations through the endurance of the built environment. The design, construction and maintenance of buildings has a tremendous impact on people and nature. With these potential impacts in mind, sustainable building should attempt to meet the following goals where applicable.¹ Every design project is unique, and the actual sustainable design elements, technologies and materials must be matched to the project's program, client goals, and budget. Use the following checklist as a starting point to review options for design projects.

Design Checklist

Design Integration

- ☐ Apply a whole systems approach to design, balancing social, economic, and environmental factors.
- ☐ Incorporate sustainability into the earliest design discussions. One possibility is to hold a sustainable design charrette to kick-off the project.
- ☐ Include input from user groups, tenants, maintenance staff, and stakeholders, to confirm design criteria.
- ☐ Explore opportunities for innovation with a collaborative, multi-disciplinary design team.
- ☐ Ensure that all design and construction team members are familiar with sustainability concepts and basic sustainable building practices and philosophy.
- ☐ Look for opportunities to design integratively and serve multiple functions with individual design elements.
- ☐ Use a group process to define and refine sustainable design goals and priorities set by the design team and the client, to aid in the design optimization process.
- ☐ Utilize well-established, credible sustainable design rating systems such as LEED or BuiltGreen to measure green performance. Look for Certified LEED professionals on consulting teams.² City Light and SPU provide a small incentive to help cover soft costs for LEED Commercial and BuiltGreen Multifamily projects.
- ☐ Conduct building performance modeling in order to investigate the interrelationships of economic and environmental performance of various building systems. Performance modeling should define the boundaries of differing design scenarios to investigate tradeoffs and optimize performance.
- ☐ Incorporate Life Cycle Cost Analysis into budget projections. Life Cycle Cost Analysis defines the projected useful life of a project and looks at the net present value of design options as investments. The goal is to achieve the highest environmental performance possible at the least cost.

¹ Grateful acknowledgements to Tom Paladino of Paladino Consulting, and Environmental Building News, sources of some of this information.

² For more info on LEED, visit the US Green Building Council website at:
<http://www.usgbc.org/programs/index.htm>

Reinforce Natural Systems

- ❑ Respond to local climatic and ecological context by incorporating solar patterns, wind patterns, hydrology and geology into design features and philosophy.
- ❑ Use a regional design palette of both plants and other materials.
- ❑ Increase benefits of vegetation by maximizing planted areas both indoors and out. This includes elevated plazas and green or living roofs, as well as interior atriums with plantings.
- ❑ Minimize ecological disturbance. Preserve natural vegetation and habitat areas.
- ❑ Use ecological design principles to mimic natural systems function, with designed systems such as constructed wetlands, composters, stormwater infiltration basins, and natural ventilation.
- ❑ Make appropriate use of land by maximizing urban land use efficiency, clustering development, and protecting open space.
- ❑ Maximize access to daylight, views and outdoor areas for building occupants.
- ❑ Create no increase in existing impervious cover. Consider decreasing impervious cover while maintaining density by stacking floorplans or tucking parking under buildings.

Conserve Energy Resources

- ❑ Increase efficiency by maximizing equipment efficiency and using control strategies.
- ❑ Reduce electricity consumption and eliminate unnecessary demand.
- ❑ Harvest natural site resources such as daylight, wind and geothermal heat.
- ❑ Include use of alternate energy resources wherever possible.
- ❑ Explore expanding the designed comfort zone with clients and customize mechanical system performance to individual needs and space requirements.
- ❑ Explore natural ventilation strategies. Seattle has an ideal climate for avoiding mechanical ventilation and cooling systems.
- ❑ If mechanical cooling is present, avoid use of HCFC's or Halon in coolants.
- ❑ Utilize building commissioning. City Light has an excellent building commissioning incentive program.
- ❑ Ensure that all applicable City Light or gas-related incentives have been utilized.
- ❑ Use CO2 monitors to maximize energy efficiency and air quality, particularly in spaces with variable occupancy.
- ❑ Minimize automobile dependence. Create incentives for public transportation options, bicycling, and walking access to basic services. Minimize automobile parking.

Manage Material Resources

- ❑ Plan for long-term use by designing for adaptability, specifying durable materials, and considering maintenance needs.
- ❑ Select sustainable material sources that minimize environmental impact.
- ❑ Minimize material use with efficient space planning, engineered materials, and modular design.
- ❑ Close the loop by utilizing re-used and salvaged materials, recycled content materials, and recycling construction demolition and waste.
- ❑ Encourage recycling of waste with easy access recycling stations and pick-up areas.
- ❑ Choose building materials with low embodied energy (energy required to obtain raw materials, manufacture, transport, and install a product), without compromising durability and performance.
- ❑ Use materials with minimal packaging waste that is recyclable, and materials that are easily recycled once their useful life has ended.
- ❑ Manage construction demolition and waste with a jobsite recycling plan.
- ❑ Utilize materials and products manufactured locally to support the local economy and minimize transportation impacts.

Protect Environmental Quality

- ❑ Protect health of building occupants and construction workers/installers/maintenance staff.

- ❑ Reduce pollutant sources in both interior and exterior environments. Use low-emitting, low VOC materials and finishes and include walk-off mats to decrease toxins entering on people's shoes.
- ❑ Eliminate environmental contamination with filtration devices for air and water systems.
- ❑ Separately ventilate mechanical rooms, storage rooms for hazardous materials, and spaces with copiers and printers.
- ❑ Dilute pollution strength by increasing ventilation or managing timing of pollutant loads before building occupancy or during off-peak hours.
- ❑ Protect ventilation systems during construction.
- ❑ Avoid ozone-depleting chemicals in mechanical equipment and insulation.
- ❑ Create opportunities for individual occupant control of temperature with operable windows or underfloor ventilation systems.
- ❑ Avoid creating outdoor light pollution. Shield fixtures and do not allow beam illumination to leave the site.
- ❑ Protect natural resources such as solar access, mature trees, habitat, wetlands, soil and water quality.

Protect Water Resources

- ❑ Maintain natural water flows by minimizing erosion and encouraging stormwater infiltration.
- ❑ Reduce potable water use by appropriately sizing systems and using water efficient technologies.
- ❑ Harvest on-site flows by reclaiming graywater, roof runoff and groundwater.
- ❑ Analyze building water use and look for efficiency opportunities such as cooling towers, commercial laundries or dishwashers, or industrial processes.
- ❑ Utilize waterless urinals. SPU's Watersmart Technology Incentive can cover most of the cost.
- ❑ Utilize submetering to help manage systems and identify leaks.
- ❑ Utilize high-efficiency irrigation system, high-tech controllers, or avoid permanent irrigation.
- ❑ Utilize Integrated Pest Management and avoid use of toxic materials that can harm water quality.
- ❑ Utilize biological treatment to improve water quality, such as bioswales or natural drainage systems.

Sustain Community

- ❑ Strengthen local economies by helping to create local jobs and markets, and emphasizing the use of local businesses, products and services. Incorporate outreach that will ensure that women and minority businesses have full opportunities to participate in contracting.
- ❑ Encourage in-fill and mixed use development.
- ❑ Create urban housing with a variety of housing types, sizes, and price ranges.
- ❑ Create strong connections to public transit options. Encourage commute trip reduction. Do not include more than the minimum required parking.
- ❑ Integrate safety and transit features for bicycles.
- ❑ Protect cultural, archaeological, and biological resources.
- ❑ Reinforce a regional aesthetic and sense of place.
- ❑ Provide aesthetically satisfying environments which value quality of life and support communities.
- ❑ Incorporate art into design expression.
- ❑ Provide for social equity and the needs of a diversity of users. Achieve universal access, not just minimum legal requirements for ADA.
- ❑ Maximize areas designed for social contact and safety. Design for pedestrian use. Consider options such as on-site child care, social services, and opportunities for social interaction.
- ❑ Incorporate educational elements into design projects to reveal building and behavioral elements that influence resource conservation and sustainable thinking.
- ❑ Explore opportunities to produce food on-site with P-Patch or other small-scale options.

Business Practices

- ❑ Print all documents double-sided. (*This is City Policy for all City-related design projects.*)
- ❑ Use recycled content paper and soy inks as much as possible.
- ❑ Utilize paperless communication as much as possible.
- ❑ Maximize use of local consultants, services and local expertise as much as possible.

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5/9/06

- ❑ Encourage recycling and commute trip-reduction by employees.
- ❑ Encourage telecommuting.
- ❑ Use public transit to travel to business meetings.
- ❑ Provide bicycles and high-efficiency or alternative-fuel vehicles for business fleet.
- ❑ Maximize water and energy efficiency and use of low-toxic and recycled materials when purchasing equipment or doing office renovations.
- ❑ Develop environmental mission statements and goals for the business.

For additional information, visit www.seattle.gov/dpd/citygreen.